
DEPARTMENT OF THE INTERIOR**Fish and Wildlife Service****50 CFR Part 17****Endangered and Threatened Wildlife and Plants; Notice of Finding on Petition To List the Ferruginous Hawk**

AGENCY: Fish and Wildlife Service; Interior.

ACTION: Notice of 90-day petition finding.

SUMMARY: The U.S. Fish and Wildlife Service (Service) announces a 90-day petition finding for a petition to amend the List of Endangered and Threatened Wildlife and Plants. The petitioner did not present substantial information to indicate that the petition to list the ferruginous hawk (*Buteo regalis*) may be warranted.

DATES: The finding announced in this notice was made on March 2, 1992.

ADDRESSES: Questions or comments concerning this finding should be submitted to Mr. Steven Anschutz, Nebraska State Supervisor, U.S. Fish and Wildlife Service, 203 West Second Street, Grand Island, Nebraska 68801. The petition, finding, and supporting data are available for public inspection, by appointment, during normal business hours.

FOR FURTHER INFORMATION CONTACT: Mr. Craig Faanes, see ADDRESSES above, telephone (308) 381-5571.

SUPPLEMENTARY INFORMATION:

Background

Section 4(b)(3)(A) of the Endangered Species Act of 1973 (Act), as amended in 1982 (16 U.S.C. 1531 et seq.), requires that the Service make a finding on whether a petition to list, delist, or

reclassify a species presents substantial scientific or commercial information to demonstrate that the petitioned action may be warranted. To the maximum extent practicable, this finding is to be made within 90 days of the receipt of the petition, and the finding is to be published promptly in the **Federal Register**. If the finding is positive, the Service also is required to promptly commence a review of the status of the involved species.

The Service received and made a 90-day finding on the following petition:

A petition from the Ferruginous Hawk Project was dated June 1, 1991, postmarked May 28, 1991, and received by the Service on May 31, 1991. The petition requested the Service to list the ferruginous hawk (*Buteo regalis*) as an endangered species. Status review for the ferruginous hawk was first initiated by a Notice of Review published December 30, 1982 (47 FR 58454).

The petition stated that the ferruginous hawk is a wide-ranging species in the prairie and intermountain region of the United States during the nesting season. The petition and accompanying documentation indicated that the survival of the species is threatened by a long-term population decline, human disturbance, and past and present habitat destruction and modification.

Upon receipt of the petition, the Service intensified its review of the status of the ferruginous hawk, and determined that the petition did not present substantial information to warrant the requested action. The results of the intensified review are presented below.

Biological Information

The ferruginous hawk has been considered a Category 2 species since 1982 when it first appeared on a Notice of Review. Although the Category 2 listing does not provide any special protection under the Act, the species is protected by the Migratory Bird Treaty Act (16 U.S.C. 703-712).

The Ferruginous hawk is the largest of the North American buteonine hawks, and is often said to be declining in numbers (Woffinden 1975, Powers and Craig 1976, Murphy 1978, Bechard 1981, Evans 1980, Houston and Bechard 1984, Schmutz 1984, Schmutz et al. 1984). Past declines have been exhibited by abandonment of many historical nest sites, although ferruginous hawks are still common in many parts of their breeding range.

The range of this species extends from North Dakota and Texas west to eastern Washington, eastern Oregon and

Nevada, and north into the prairie provinces of Canada (Olendorff and Fish 1985). Ferruginous hawks winter in the southwestern United States (California to Oklahoma and Texas) and Mexico (American Ornithologists Union 1983). Ferruginous hawks are irregularly found in winter in Colorado (Ryder 1969, Johnson and Enderson 1972, Stahlecker and Behlke 1974), the Dakotas (Steenhoff 1984), Nebraska (Mathisen and Mathisen 1968), and Idaho (U.S. Bureau of Land Management 1977, Craig 1979).

Declines in ferruginous hawk numbers have been blamed on urbanization, agricultural development, overgrazing, and both intentional and inadvertent human disturbance (Olendorff and Fish 1985). Detailed analyses of historical populations of ferruginous hawks have not been made for most of the United States (Olendorff and Fish 1985).

Continual direct human disturbance is an overriding negative factor to which ferruginous hawks are poorly adapted (Porter and White 1977). White and Thurow (1985) reported that ferruginous hawks were more sensitive to disturbance when jack rabbit populations were low. If prey habitat can be managed to provide a more stable or alternative food supply when one prey species declines severely, then ferruginous hawks will benefit (Olendorff and Fish 1985). Likewise, if numerous nest sites are made available, the birds have a greater opportunity to avoid disturbance in a given year by selecting more secluded sites. On the other hand, loss of prey habitat and nest sites causes instability and/or decreases in ferruginous hawk populations (Stewart 1975, Bechard 1981, Houston and Bechard 1984, Schmutz 1984).

Unlike many other *Buteo* hawks, ferruginous hawks are rather restrictive in their selection of prey items. In 7 of 13 study areas summarized by Olendorff and Fish (1985), ground squirrels were the most important prey items identified. Further, Woffinden (1975), Woffinden and Murphy (1977), Smith and Murphy (1978, 1979), Thurow et al. (1980), Smith et al. (1981), and White and Thurow (1985), clearly established the correlation between jack rabbit numbers and the percentage of ferruginous hawk territories occupied, eggs laid, and young fledged. The maintenance of high breeding densities, reproductive rates, and recruitment of ferruginous hawks is dependent on high prey populations and the stability of the habitats on which these prey species depend.

Ferruginous hawks have an inherently high breeding potential compared to other large diurnal raptors. This high reproductive potential allows rapid

recovery of populations when prey increases after natural or man-caused declines. Woffinden and Murphy (1989), however, indicated that ferruginous hawks did not return to Cedar Valley, Utah, following a severe jack rabbit decline, even though jack rabbit populations had since increased.

Impacts of human activities on ferruginous hawks fall into four broad categories: (1) Increased human disturbance which results in decreased reproductive performance; (2) direct mortality; (3) habitat alteration which decreases prey; and (4) habitat alteration which decreases nest site availability. Blair (1978) established that human activity is avoided by this hawk. He measured the distance from 36 active nest sites and 36 randomly selected points to the nearest human activity. Mean distance from nest sites to disturbance was significantly greater than from random points by about 1 km (0.6 mi) (3.31 versus 2.47 km) (2.0 to 1.5 mi). Blair also found higher clutch sizes and greater hatching success at nests more distant from human disturbance, although the findings were not supported by statistical tests.

Intensive agricultural development renders grasslands, shrublands and pinyon-juniper forests essentially useless as ferruginous hawks nesting habitat, although not necessarily as foraging habitat (Olendorff and Fish 1985). A Habitat Suitability Index model prepared for ferruginous hawks (Jasikoff 1982) assumed that if 10 percent of an area is disturbed, not necessarily developed, then the suitability index for ferruginous hawks would decrease. If 75 percent or more of an area is disturbed, the suitability index would be zero. The point at which the suitability index value is zero may be less than 75 percent if the disturbance is cultivation (Schmutz 1984).

Olendorff and Stoddard (1974) found only 1 of 71 ferruginous hawk nests in northeastern Colorado in cultivated land. Roth and Marzluff (1989) found only 5 ferruginous hawk nests where cropland was over 50 percent but 59 nests where rangeland prevailed. Cottrell (1981) noted that in eastern Oregon cultivated lands were used as nest areas significantly less than expected on the basis of availability (only 1 of 46 nests in farmland). Gilmer and Stewart (1983) noted very low ferruginous hawk nesting densities in the Drift Plain biotic region of North Dakota which is dominated by cropland, compared to the Missouri Coteau and Coteau Slope regions which are characterized by high proportions of native mixed-grass prairie.

The reason for avoidance of frequently plowed fields by ferruginous hawks involves a combination of lower prey densities in monotypic agriculture, absence of trees for nest placement, and springtime activities of farmers—a time when raptors in general are more susceptible to human disturbance (Olendorff and Fish 1985). As the crops grow, plowed or not, prey becomes increasingly less vulnerable due to the concealment provided by crop height. If no other prey is available and if it is not energetically efficient to feed several young at the nest, reproductive performance is adversely affected (Olendorff and Fish 1985).

Criteria for Listing

Section 4(a)(1) of the Act states that a species may be listed as an endangered or threatened species because of any of the following factors:

- (1) The present or threatened destruction, modification, or curtailment of its habitat or range;
- (2) Overutilization for commercial, recreational, scientific, or educational purposes;
- (3) Disease or predation;
- (4) The inadequacy of existing regulatory mechanisms; or
- (5) Other natural or manmade factors affecting its continued existence.

Following is the Service's evaluation of each of these five factors.

(1) Present or Threatened Destruction, Modification or Curtailment of its Habitat or Range

Population Status

The factors summarized above describe a highly sensitive, wide-ranging, habitat-specific hawk. Determination of its population status over its extensive range is difficult due to the reasons discussed below.

Monitoring populations in small areas on the breeding grounds is potentially misleading because the abundance of nesting birds may reflect cyclic fluctuations in prey abundance rather than actual hawk population fluctuations (Smith et al. 1981). Woffinden and Murphy (1989) concluded that traditional short-term, fixed boundary studies, as most have been with ferruginous hawks, may not accurately assess the status of the species in some areas. Wiens (1984) argued that long-term studies are critical proper understanding of the structure of populations.

In 1979, Mr. Mayo Call, a consulting wildlife biologist in Afton, Wyoming, surveyed State and Provincial wildlife agencies in the Western United States

and Canada. The purpose of Mr. Call's survey was to determine a continental population figure for the ferruginous hawk. In 1991, the petitioner completed a similar survey contacting the same wildlife agencies. Upon receipt of the petition, the Service contacted these same agencies, as well as other individuals, in an attempt to obtain more precise population figures throughout the ferruginous hawk's extensive range. In addition to contacting the State and Provincial resource agencies, the Service also placed a request for information in the Ornithological Newsletter, which is

distributed regularly to each member of the American Ornithologist's Union, Cooper Ornithological Society, Society of Field Ornithologists, and the Wilson Ornithological Society. The Service also placed a similar request in the newsletter of the American Birding Association. Federal land management Agencies in each of the States within the species' United States range were also contacted for information.

The results of the 1979 and 1991 surveys are summarized in Table 1. The data indicate that in 1979 the continental population of ferruginous hawks was 2,810 to 3,590 pairs (average of 3,200

pairs) (Call, unpub. data). The petitioner's survey yielded a population figure of 3,293 to 4,291 pairs (average of 3,792 pairs). The population appears to have increased by 483 to 701 pairs (average of 592 pairs) at a minimum. The literature review completed by the Service in addition to survey of additional resource personnel added 1,463-1,713 pairs in North America for a minimum population of 5,220 to 6,004 pairs. This estimate does not include nonbreeding birds ecologically known as "floaters," which are difficult to census.

TABLE 1.—ESTIMATED NUMBER OF NESTING PAIRS OF FERRUGINOUS HAWKS BY LOCATION IN NORTH AMERICA. DATA ARE FROM A 1979 UNPUBLISHED SURVEY BY MR. MAYO CALL, A 1991 SURVEY BY THE PETITIONER, AND A REVIEW OF THE LITERATURE CONDUCTED BY THE SERVICE

State/Province	1979	1991	Review
Arizona.....	5-10	25	25
California.....	0	1	1
Colorado.....	150-175	300-400	300-400
Idaho.....	200-250	72	100
Kansas.....	25-50	35-50	50-100
Montana.....	175-250	190-450	190-450
Nebraska.....	25	35	35
Nevada.....	350-450	240	240
New Mexico.....	10	22	35
North Dakota.....	350-450	200	200
Oklahoma.....	10-20	20-33	20-33
Oregon.....	125-150	200	250
South Dakota.....	350-375	400	400
Texas.....	5-10	0	0
Utah.....	200-225	190-300	190-300
Washington.....	30-40	63	62
Wyoming.....	400-600	800	800
Canada.....	500-700	500-1,000	2,322-2,572
Totals.....	2,810-3,590	3,293-4,291	5,220-6,004
Mean.....	3,200	3,792	5,612

A State-by-State and Province-by-Province summary of the species' status follows.

Arizona

The population was estimated at 5-10 pairs in 1979 (Call, unpub. data). The petitioner estimated 25 pairs in 1991.

Historically, the ferruginous hawk was an uncommon but widely distributed summer resident of the grassy plains of northern Arizona, and a local and irregular summer resident in southeastern Arizona (Phillips et al. 1964). Currently, the largest ferruginous hawk nesting population exists in the drainages of the Little Colorado River and Cataract Creek (Coconino Plateau). No population estimates are available for this area, but eight nesting areas are known from the northern part of the State (Hall et al. 1988). Active breeding areas are presently only in northwestern Arizona where two ferruginous hawk nests are known (Rosenberg et al. 1981). The Kingman District of the Bureau of

Land Management reported (in litt.) that ferruginous hawks have not been detected since 1986 in their traditional breeding areas in the Hualapai Valley, northeast of Kingman, Arizona, between the Cerbat and Music Mountains. The Bureau of Land Management believes further that if the species is still nesting in the area there may be less than five pairs present. In winter, ferruginous hawks are fairly common in northern and southeastern Arizona, and relatively rare elsewhere in the State (Phillips et al. 1964, Milsap 1981). Other sources indicate recent winter concentrations in agricultural areas near Parker, Arizona; in western Arizona surrounding Phoenix; in Yavapai County in central Arizona; and in the Sulfur Springs Valley in 1984). The winter population appears to be stable (Hall et al. 1988).

California

The population was zero in 1979 (Call, unpub. data). The petitioner listed one

pair in 1991. Historic information on the ferruginous hawk in California is scanty. Grinnell and Miller (1944) regarded the species primarily as a winter visitor; however, the authors stated that "a few individuals occur in summer and may nest in the northwestern corner of the state of Modoc County."

Areas of potential nesting habitat in northeastern California were well covered by knowledgeable raptor biologists in the late 1970's and 1980's. Although there were occasional summer sightings, no nesting locations were known until 1987 when Bureau of Land Management personnel found a nest in Lassen County.

Potential nesting habitat appears to be extensive in California, and biologists have long wondered about possible reasons for the virtual absence of the species in that State. Intrusion of junipers and sagebrush on grasslands may have negatively affected potential nesting habitat.

Ferruginous hawks are found in low numbers in grassland and agricultural areas throughout the State in winter and fall. Although it may be undergoing some decline due to agricultural and urban conversions, winter habitat remains extensive.

Colorado

The population was estimated at 150–175 pairs in 1979 (Call, unpub. data). The petitioner estimated 300–400 pairs in 1991.

Olendorff (1978) studied nesting raptors on a 1,072 km² (414 mi²) study area of the Pawnee National Grasslands in northeastern Colorado during 1970–1972. Habitat of the study area was made up of 6.5 percent cultivated land; the remainder was native grassland. Nesting success among ferruginous hawks was 69.8 percent among 53 nests during the study.

Stalmaster et al. (1991) studied nesting ferruginous hawks in a 743 km² (287 mi²) area in northwest Colorado and northeast Utah from 1981 to 1988. Desert cottontails and white-tailed prairie dogs were the principal food items (94 percent of biomass). Prey declined more than 97 percent from 1983 to 1988. In response, hawks occupied fewer territories, produced fewer young, and increased the diversity of their diets. Nest failures increased from 25 percent in 1983 to 74 percent in 1988. Hawk reproduction increased in 1987 and 1988 once prey density increased. Whereas abundant food supplies often attract new individuals to a breeding area (Smith and Murphy 1978), the authors believed that given the nomadic tendency of ferruginous hawks, eruptions of prey populations in one area may buffer the effects of food deprivations in other areas.

Leslie (1990) revisited Olendorff's (1978) study area on the Pawnee National Grasslands and compared 1990 data with that collected by Olendorff in 1972. Although populations of other raptors increased from 109 to 200 percent, ferruginous hawk populations decreased by 38.5 percent, from 26 pairs in 1972 to 16 pairs in 1990.

Idaho

The population in 1979 was estimated at 200–250 pairs (Call, unpub. data). Petitioners estimated 72 pairs in 1991. Dr. Mark Bechard, Raptor Research Center, Boise State University (pers. comm., 1992), stated that the minimum population in Idaho was 100 breeding pairs.

Kochert et al. (1988) studied ferruginous hawk reproduction on a 978 km² (377 mi²) study area of the Snake River Birds of Prey Area from 1978 to

1980, and again in 1985. During the study a maximum of 23 and a minimum of 13 territories were occupied in a single year. The proportion of traditional territories occupied each year ranged from 50 to 82 percent. Prey abundance did not appear to influence occupancy rates or the frequency with which particular nesting territories were occupied. Their data indicated that ferruginous hawks on the study area tended to occupy territories intermittently for short durations.

Thurrow et al. (1980) reported similar observations for ferruginous hawks in southern Idaho, with 39 percent of their territories being occupied at intermittent intervals for 7 to 9 years.

Howard (1975) studied nesting ferruginous hawks in the Curlew and Raft River Valleys of Idaho and Utah during 1972 to 1973, finding 42 and 54 pairs those years. Northern pocket gophers made up 57.4 percent of the prey items in the crested wheatgrass community. Howard believed that the total number of young ferruginous hawks produced per year may be related to jack rabbit densities.

Kansas

The population was estimated at 25–50 pairs in 1979 (Call, unpub. data). The petitioner estimated 35–50 pairs in 1991. Mr. Stanley Roth, the principal ferruginous hawk researcher in Kansas (Lawrence High School, Lawrence, Kansas), estimates 50–100 pairs in 1992 (pers. comm., 1992).

Roth and Marzluff (1989) studied the ecology of ferruginous hawks in an eight-county area of the upper reaches of the Smokey Hill River in northwestern Kansas from 1979 through 1987. They found 100 nesting areas and 181 different active nests in their study. On the average, 38 nest sites were active each year. Activity declined through 1985, but increased again in 1986 and 1987. Prairie dogs are a major prey item for ferruginous hawks in western Kansas. Prairie dog towns are abundant in western Kansas, and the infrequent occurrence of ferruginous hawk nests further than 8 km (5 mi) from prairie dog towns, which Roth and Marzluff (1989) observed, may reflect a behavioral response to prey abundance by the hawks placing nests near their prey source.

Montana

The population was estimated at 175–250 pairs in 1979 (Call, unpub. data). The petitioner estimated 190–450 pairs in 1991. However, several authors suggest that the population of ferruginous hawks in Montana appears to be stable or

declining slowly (Ensign 1983, DuBois and Becker 1987, Harmata 1991).

Myers (1987) evaluated ferruginous hawks nesting on a 417 km² (161 mi²) intensive study area in southwestern Montana during 1985 and 1986. Myers found 316 nests in an estimated 97 nesting territories. Ferruginous hawks in southwestern Montana appear to be more productive than those in eastern Montana, with 1.45 to 1.85 young fledged per occupied nest, compared to 0.3 to 0.38 young fledged per nest in eastern Montana. Ensign (1983) studied ferruginous hawks on 492 km² (190 mi²) of public land in southeastern Montana during 1981 and 1982. Ninety-one nests were located during the study representing an estimated 95 percent of all nests present in the study area. Ensign believed that the present status of breeding populations of ferruginous hawks in Montana is uncertain. Nesting concentrations occur in the extreme southwest (Myers 1987) in Beaverhead County, and in the extreme southeast in Carter County. In addition, scattered nesting has been reported in the northern tier of counties east of Havre.

Nebraska

The population was estimated at 25 pairs in 1979 (Call, unpub. data). The petitioner estimated 35 pairs in 1991.

Nevada

The population was estimated at 350–450 pairs in 1979 (Call, unpub. data). The petitioner estimated 240 pairs in 1991.

Few long-term studies of ferruginous hawks nesting have been conducted in Nevada. Neel et al. (1989) reported that 66 occupied nesting territories were extant on the Egan Resource Area in 1982. Bradley et al. (1991) reported that the number of occupied nests on the Egan Resource Area had declined to 34 in 1991.

New Mexico

The population was estimated at 10 pairs in 1979 (Call, unpub. data). The petitioner estimated 22 pairs in 1991. The literature indicates a minimum population of 35 pairs.

Ligon (1981) reported this species as nesting "sparingly" throughout New Mexico. Ramakka and Woyewodzic (1991) studied ferruginous hawks on a 181,900 ha (400,000 ac) belt about 16 km (10 mi) wide between Farmington and Cuba, New Mexico. Subsequent monitoring and inventory efforts expanded the study area to 550,400 ha (1,359,500 ac). They found 72 ferruginous hawk nests by the end of 1988. Based on their observations of nest use in successive seasons, they believed that

the nests represent a minimum of 35 different nesting territories.

North Dakota

The population was estimated at 350–450 pairs in 1979 (Call, unpub. data). The petitioner estimated 200 pairs in 1991.

Gaines (1985) studied birds in 1983 and 1984 in Kidder and Stutsman Counties on a 1,259 km² (486 mi²) study area.

Seventy-five occupied ferruginous hawk nests were located in 1983 and 79 nests in 1984. These numbers were similar to those found by Gilmer and Stewart (1983) during 1977 to 1979. Nesting success for 1983 to 1984 was 62.1 percent, which was lower than 71.1 percent in 1977 to 1979. An average of 1.6 young fledged per occupied nest during the 2 years. Gaines reported that many ferruginous hawks were using his study area and that there is much grassland habitat relative to other biogeographic regions. Not far to the east in the Red River Valley, both ferruginous hawks and grasslands are essentially absent, and the predominant land use is cropland.

Oklahoma

The population was estimated at 10–20 pairs in 1979 (Call, unpub. data). The petitioner estimated 20–33 pairs in 1991.

Oregon

The population was estimated at 125–150 pairs in 1979 (Call, unpub. data). The petitioner estimated 200 pairs in 1991. The literature indicates a minimum population of 250 pairs.

Lardy (1960) located 32 ferruginous hawk pairs on the 312 km² (120 mi²) North Harper Study area. Lardy also surveyed Oregon wildlife biologists and determined that 100 active ferruginous hawk nests had been identified in Oregon. Based on these numbers, Oregon wildlife biologists estimated that there are about 250 pairs in the State. Specifically, the population was estimated at: Gilliam County—2 pairs, Morrow County—10 pairs, Umatilla County—5 pairs, Union County—0 pairs, Wallowa County—25 pairs (55 estimated), Grant County—8 pairs; Baker County—2 pairs, Harney County—13 pairs (100 estimated), and Malheur County—38 pairs (50 estimated). Henjum (1987) inventoried nesting raptor populations in Union and Baker Counties, finding zero ferruginous hawk pairs in Union County, but 33 pairs in Baker County. This is an increase of 31 pairs over Lardy's (1960) count.

South Dakota

The population was estimated at 350–375 pairs in 1979 (Call, unpub. data). The petitioner estimated 400 pairs in 1991.

Few long-term or short-term studies of ferruginous hawks have been conducted in South Dakota. Blair and Schitoskey (1982) studied ferruginous hawks on a 7,000 km² (2,703 mi²) area in northwestern South Dakota, including all of Harding County in 1976 and 1977. They found 24 pairs in 1976 and 17 pairs in 1977. The density of ferruginous hawks on their study area was lower than that found in other areas of the Dakotas.

Texas

The population was estimated at 5–10 pairs in 1979 (Call, unpub. data). The petitioner estimated zero pairs in 1991.

Schmutz (1987a) studied the winter ecology and survival of ferruginous hawks in an 11-county area of northwestern Texas. Ferruginous hawks were the most abundant raptor with an estimated 2,464 individuals present. Based on sightings of 2 banded individuals and 47 unbanded, the total grassland population of individuals and 47 unbanded, the total grassland population of ferruginous hawks east of the Rocky Mountains contained 14,000 individuals. The distribution of ferruginous hawks in the study area in relation to land use suggested that patches of grassland supporting prairie dogs intermixed with extensive cultivation attracted many ferruginous hawks. Schmutz (1987a) reported that the distribution of ferruginous hawks in the study area in relation to land use suggests that agricultural practices and extensive human activity had no negative effect on this hawk during the winter period.

Utah

The population was estimated at 200–225 pairs in 1979 (Call, unpub. data). The petitioner estimated 190–300 pairs in 1991.

Woffinden and Murphy (1989) conducted the most extensive long-term study of ferruginous hawks in the literature. Their study area included 238 km² (92 mi²) of a 932 km² (360 mi²) area in parts of Cedar, Rush, Skull, and Dugway Valleys in west-central Utah. In 1967, 13 nesting pairs fledged 8 young ferruginous hawks. The following year 14 pairs produced 28 young. Production remained high through 1972 when 31 young were fledged from 16 occupied territories. Then ferruginous hawk reproductive effort declined sharply with a drop in prey numbers. Wagner and Stoddard (1972) suggested that jack

rabbit populations were cyclic with peak numbers occurring every 7–10 years. Jack rabbit populations in Woffinden and Murphy's study area declined again prior to the 1984 season when another intensive search was conducted. No hawks were observed in the area during the 1986 nesting season. One prey species, the black-tailed jack rabbit, normally made up about 95 percent of the ferruginous hawk prey biomass (Smith and Murphy 1973). Even though jack rabbit population in Cedar Valley peaked during the 1980 nesting season, an expected increase in ferruginous hawk numbers did not occur. Thus, members of this local population failed to respond positively to increasing prey numbers, and the ferruginous hawk may currently be extirpated from the area as a nesting species. Even though the ferruginous hawk population appeared to be on the increase during the early part of the study, the demise of the population may be explained by the interaction of low production and estimated mortality rates. The authors suspect that extinction was influenced by high mortality rates and habitat alteration. Circumstantial evidence suggests that some individuals may also have left the study area in response to low prey densities.

Washington

The population was estimated at 30–40 pairs in 1979 (Call, unpub. data). The petitioner estimated 63 pairs in 1991. The Washington Department of Wildlife estimated 62 nesting pairs in 1987.

The first comprehensive study of the ferruginous hawk in Washington was conducted by Bowles and Decker (1931), who described nests, clutch sizes, food habits, interspecific relations, and habitat use. Since that time, the lands of eastern Washington have undergone tremendous change, resulting from intensive dryland wheat farming, irrigation, water development, and urban sprawl (Pitzner et al. 1977). Fitzer et al. (1977) studied ferruginous hawks in a 38,848 km² (15,000 mi²) area including 12 counties in southeastern Washington. They found 31 nest sites. In 1974, 23 nest sites were located, of which 9 were active. A survey of the available nesting habitat revealed that no fewer than 15, and perhaps 20 pairs, of adult birds bred in the State. Of these, 12 or 13 pairs will likely produce young each year.

The ferruginous hawk is listed by the State of Washington as a threatened species because its occurrence level is low. However, the margin of the species' normal range only extends into eastern

Washington; therefore, numbers are not expected to be high. The last Statewide survey, conducted in 1987, totaled 62 nesting pairs after searching 103 historic territories. To date, those territories seem to be secure without a major threat of destruction or disturbance. The Washington Department of Wildlife is planning another comprehensive population survey in 1992.

Wyoming

The population was estimated at 400–600 pairs in 1979 (Call, unpub. data). The petitioner estimated 800 pairs in 1991. Quantified information is lacking on the historical population status of ferruginous hawks in Wyoming. McCreary (1939) indicated that the species was common and widespread. The current breeding distribution of the ferruginous hawk is Statewide in Wyoming, excluding the mountainous areas. Raptor surveys and incidental reports have revealed 483 nesting locations in Wyoming (Oakleaf 1986). Estimates by degree of latitude and longitude (latilongs) indicate that the Statewide population certainly exceeds 800 nesting pairs (Oakleaf 1986). The widespread distribution and abundance of the ferruginous hawk tends to place this species at a lower priority for attention from the Wyoming Game and Fish Department's nongame program (Oakleaf 1985).

Canada

Based on evidence of a 50 percent reduction in the breeding range of the ferruginous hawk in Canada, the Committee on the Status of Endangered Wildlife in Canada assigned "threatened" status to this species in 1980 (Schmutz 1989). An attempt is being made in Canada in 1992 to downlist the ferruginous hawk from threatened to rare because of the increasing population size (W. Harris, Saskatchewan Provincial Wildlife Agency, pers. comm., 1992).

The population was estimated at 500–700 pairs in 1979 (Call, unpub. data). The petitioner estimated 500–1,000 pairs in 1991. Schmutz (1989) reported 1,772 pairs in Alberta in 1987. Smith (1987) estimated a minimum population of 170 nesting pairs in Saskatchewan. W. Harris (pers. comm., 1992) stated that the minimum breeding population in Saskatchewan in 1991 was 500 breeding pairs and may be closer to 750 pairs. DeSmet and Conrad (1991) reported an estimated population of 50 pairs in Manitoba. These estimates provide a minimum population of 2,322–2,572 pairs in Canada.

Manitoba

Ferruginous hawks were probably never widely distributed in historic times. In 1984, Ratcliff and Murray (1984) located a ferruginous hawk nest in southwestern Manitoba, the first known nest record in the province in 57 years. During 1987, 11 nests were found in the extreme southwest from Broomhill to Lyleton. Ferruginous hawks were observed in 23 other townships north to St. Lazare and east to Ninga. During 1988, 32 nests were found north to Lenore and Rivers, and east to Shilo, Treesbank, and Hilton. Adults were also observed in 17 other townships during the breeding season north to St. Lazare, and east to Oak Hammock Marsh north of Winnipeg. Whether or not ferruginous hawk populations have expanded in Manitoba during the 1980's is open to speculation (DeSmet and Conrad 1991).

Saskatchewan

Macoun and Macoun (1909) reported that on their westward travel in 1906, they noted ferruginous hawks "regularly and commonly" between Yorkton and Edmonton. Houston and Bechard (1984) provided a detailed account of the breeding distribution and its retraction over time. Currently ferruginous hawks are reasonably abundant in an L-shaped area including 20 percent of their former range, bordering Alberta and Montana. W. Harris (unpubl. data) recorded a steady increase from 13 nests in 1980 to 20 nests in 1988 on a 400 km² (155 mi²) area in extreme southwestern Saskatchewan. In Saskatchewan as well as Alberta, the northern areas of the ferruginous hawks' historic range that have been vacated by the species have been invaded by aspen stands from the aspen parkland to the north (Houston and Bechard 1984).

Alberta

Schmutz (1987b) searched for ferruginous hawks on 76 study plots in 1982 and 83 plots in 1987. The number of ferruginous hawks recorded was 45 in 1982 and 76 in 1987; a 69 percent increase. An estimate by Schmutz (1991) suggested that 1,772 pairs of ferruginous hawks nested in the study area in 1987; about 700 more than in 1982. Ninety-five percent confidence intervals were 653–1,511 pairs in 1982; 1,283 to 2,261 pairs in 1987. The results of this work suggest that ferruginous hawks now nest more abundantly and more widely in southeastern Alberta than they did 5 years ago.

Winter Range

Warkentin and James (1988) examined data from the annual Christmas Bird

Count to assess changes in the distribution and abundance of the ferruginous hawk across its wintering range from 1952 to 1984. A significant increase in numbers occurred over this period; most pronounced over the last 11 years. By combining all regions to create a yearly mean of hawks per 1,000 miles covered, it was found that over the 33-year period there has been a highly significant increase in the number of ferruginous hawks recorded on Christmas Bird Counts.

Considering only the first 24 years of data, there was no significant change in the population recorded on the counts. Data from 1984 were analyzed to assess the impact of recently added counts on the rapid increase in the number of ferruginous hawks seen, beginning about 1974. The mean number of hawks seen on all counts added since 1974 and included in the 1984 count was not significantly different from the mean of those counts in 1984 from locations which had also been a part of the 1974 count. Much of the increase in numbers can be attributed to changes over the last decade. Of primary interest is the fact that over the last 11 years there has been a dramatic overall increase in ferruginous hawk numbers (Warkentin and James 1988).

The comparison between the mean number of ferruginous hawks seen for the established and more recent counts suggests that this increase is not attributable simply to the inclusion of new areas with disproportionately large numbers of ferruginous hawks. Possible reasons for the increase include: (1) Greater awareness of raptor conservation, (2) greater awareness of researchers concerning sensitivity for ferruginous hawks to disturbance, and (3) the introduction of artificial nest structures in several areas. The result has been an apparent increase in nesting density and reproductive success, which may also have contributed to increased population levels (Schmutz et al. 1984).

(2) Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

The Service found no information to suggest that the ferruginous hawk population has been hampered by any of the criteria in this factor. The Service is not aware of any commercial or recreational activities that would impact this species, because it is a nongame animal and therefore not hunted.

The Service is further not aware of any extensive collection of ferruginous hawk specimens for scientific or educational purposes.

(3) Disease or Predation

The Service is aware of only one instance of ferruginous hawk mortality from disease. Cooper and Pugsley (1984) diagnosed a malignant mesothelioma (tumor) in a 4-year old female ferruginous hawk that had been kept in captivity. Several references cited in Olendorff and Fish (1985) describe predation on nestling ferruginous hawks. However, no widespread problem with predation is known throughout the species' range.

(4) The Inadequacy of Existing Regulatory Mechanisms

The ferruginous hawk currently receives Federal protection through the Migratory Bird Treaty Act (16 U.S.C. 703-712) Treaty Act). The Treaty Act protection extends to the bird, its nest, eggs, or any parts thereof. Further, the Bureau of Land Management has made significant strides in ferruginous hawk management, particularly under the authority of the Federal Land Policy and Management Act of 1976 (Management Act). The principal management responsibility of the Bureau of Land Management, in relation to wildlife, concerns habitat (Olendorff et al. 1989). The Management Act formalizes the principles of multiple use and sustained yield as Bureau of Land Management missions. The Bureau of Land Management has developed and implemented several intensive habitat management efforts for ferruginous hawk with the Management Act as its authority (Olendorff et al. 1989).

(5) Other Natural or Manmade Factors Affecting its Continued Existence

No such factors were identified or recognized at this time.

Summary

The foregoing discussion indicates that the ferruginous hawk is highly variable in its annual population levels. Much of this variability may be due to fluctuations in the prey species on which the hawk feeds. Habitat alteration may also play an important role in short-term data that are available, however, indicate that the continental population of ferruginous hawks, at least at the moment, appears to have increased over the last 13 years. Circumstantial evidence suggests further that the species is currently adapting positively to various management techniques designed to enhance its population, not least of which is the establishment of artificial nest structures. After review of the petition, accompanying documentation, references cited therein, and other

information obtained, the Service found that the petition presented information insufficient to conclude that the requested action may be warranted.

References Cited

A complete list of all references cited herein, as well as others, is available upon request from the Grand Island, Nebraska, Field Office. See **ADDRESSES** above.

Author

This notice was prepared by Mr. Craig A. Faanes (see **ADDRESSES** above).

Authority: The authority for this action is the Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1544).

List of Subjects in 50 CFR Part 17

Endangered and threatened species. Exports, Imports, Reporting and record keeping requirements, and Transportation.

Dated: August 6, 1992.

Richard N. Smith,

Acting Director, Fish and wildlife Service.

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